

## UNCLE SAM AS A FISHERMAN.

## STRANGE CATCHES IN THE WORLD UNDER THE OCEAN.

Stories of Deep Sea Explorations That Will Interest Boys—How Uncle Sam Tries to Catch Fishes Miles Below the Ocean—Fish That Carry Lights—Tiny Sharks and Sea Serpents.

The imagination of no story-teller ever created stranger beings than the real ones that Uncle Sam has been finding in the past years in his trips to the under-world.

This under-world is not far away from us. Its thousands of inhabitants dwell within a few miles of our own coasts. Travelers on steamships are only a mile or so from things that would terrify them unpeppably if they could see them.

But that mile is straight downward; and no one being formed like one of us could exist there for an instant. The weight of that mile of water would crush a man into nothingness. It crushes great iron spheres that are let down into it now and then by Uncle Sam.

Yet there is busy life there, in the blackness of everlasting night. Weir forms crawl and glide and swim everywhere. They are built so that they can withstand the pressure.

Indeed, they need it to live, for whenever a few of them are dragged upward by Uncle Sam's deep-sea net they die long before they reach the surface. Some of the more delicate ones actually explode like toy balloons when they are pulled into the upper waters where the pressure is not great.

Uncle Sam's long sounding wires and trawls have brought up big and little creatures from many thousands of fathoms deep, but he knows that, although he may fish in that way for many years to come, he need not hope to catch any of the swift and huge beasts that may dwell down there, or, indeed, to capture even a fair proportion of the smaller ones.

Uncle Sam has learned enough of the world under the seas, however, to know that if a human being could get into it all the wonder stories ever told by man would seem like old, matter-of-fact narratives.

It is a world without a sun. Nothing that lives there has ever seen that planet rise or set.

There are fish that black above there is light—strange, frightening light of many tints that flits and flutters and throbs through the dark, icy waters. It is made by the inhabitants of the ocean floor themselves.

Some of them have eyes that shine like lanterns. Some have spots along their sides that glimmer as they dart by, as the lighted windows in an express train gleam for a moment through the night on earth as the cars rush past.

There are many different cephalopods and eel-like creatures, with six and seven and eight arms, that are white and flimy as clouds as they float along, surrounded by a blur of light like an electric lamp seen through a dense fog. There are coal-black things that are all mouth, set with fringes of teeth like bent needles, bristling from end to end of their gape.

There are fish with staring eyes, larger than the eyes of any animal of the land. There are others that are only a few inches long, but that find two tiny specks, no bigger than the holes that might be made by the thrust of a very small pin.

There are sharks no longer than a lead pencil and others many feet long that are shaped like serpents.

Of the devil fishes and squids alone, there are many hundreds of different kinds. Some of them are as big as a whale. They are white and red and black and yellow.

Some of them have their eyes set on stalks, like the world as if they were peering at the world around them through beautiful little opera glasses. Many of the deep-sea fishes have such telescope eyes.

Some of them have the telescopes projecting forward. Others have them looking straight upward. There are many wondrous pranks with eyes in her under-world. A fish has been caught a mile deep in the south Atlantic Ocean that had no eyes at all, as we are accustomed to think of eyes.

Instead, it had two burnished convex mirror-like lenses sunk deep in its head. They were golden in color and reflected the daylight from the surface of the sea. In the Antarctic Ocean fish have been dredged up from even greater depths with their eyes carried far away from their heads on long, jointed stalks, as do the blossoms on plants.

The first key of the many that finally were formed by the world as it was, this unknown world was fashioned by one of Uncle Sam's boys. He was a midshipman in the United States Navy, a Virginian, and his name was John H. Gregory. He made a deep-sea sounding rod that at once made it possible to measure depths never dreamed of before.

Although he invented it in 1854, it was not until 1890 that it served the purpose as well that even now, after almost half a century, all sounding apparatus is based on it. Capt. Sigbee, who was commander of the Maine when she was blown up, had one of the world's greatest authorities on measuring the deep sea, says that there is no sounding rod that is not in some way a modification of that young midshipman's.

There had been some measuring of the deep sea before that invention, but it was slow and crude work. It was no light task to haul up the heavy rope that had to be used in order to bear the strain of lifting a 50- or 100-pound weight out of many hundred fathoms of ocean. Too often the weight would tear the rope long before it was brought to the surface.

Young Gregory's invention made it possible to let go of the weight when it touched bottom, so that all that needed to be hauled up was the very light tube hauled with samples of the bottom and other instruments that were attached to the line.

In 1890 Uncle Sam built his steamship Fish Hawk, the first large vessel constructed by any nation to study fish. The beautiful Albatross followed.

Since she was launched she has made more than 6,000 deep sea soundings and has hauled nets and dredges in water from 1,000 feet to 20,000 feet and even to 2,000 fathoms. Nearly 300 books and pamphlets have been written as the result of her work.

Sigsbee made the deepest haul of a net ever made in the world. It was off the Tonga Islands in the South Pacific and her trawl was sunk to the bottom, 23,000 feet below her keel.

Animals were found down there, living where the water constant is only just above the freezing point and where there is a pressure of 2,300 pounds to the square inch. Human beings on the land live under a pressure of only fifteen pounds to the inch.

Uncle Sam has made not only the deepest net haul ever made, but he has also trawled the deepest spot ever found in the ocean. It was with his ship *Nero* when she was surveying the Pacific Ocean for the new cable. In the western Pacific Ocean she dropped her sounding rod and the wire ran out until it registered a depth of 31,614 feet. The wire was then hauled in, and it was found that it had again, in a work requiring more than three hours. To sink a deep sea net and bring it back on board requires a day of work.

The wire that is used for sounding is wound carefully on a reel that is so full of lead and is so heavy that it is so full of lead that it looks like an engine. The great object is to send the wire out free from kinks. A kink is practically the only way

in which it can be broken, for it is tempered beautifully to resist the strain. It is so strong that it is built firmly on a little platform overhanging the side of the ship. When a sounding is to be made the weight to take it down is attached, and the pressure sometimes a dozen appliances are hung to it here and there.

One thing is a thermometer to register the temperature on the bottom. It is so made that it does not begin to work until it strikes the bottom, and after it makes its record it stops.

The sounding wire opens when it reaches the bottom, flits itself with a sample of sea water and shuts again. Another tube, with valves, collects mud or sand. A cylinder many feet down to register the pressure of the water.

Everything that is attached to the wire represents much labor and thought to make it perfect. It must work just right, for no human hand can reach it after it begins its voyage into the under-world.

When the wire is given the wire is released and it goes slowly and steadily. Men watch it constantly that it shall not go too fast.

Whenever a certain number of feet has run, a little more pressure is applied to the brake on the reel to counteract the weight of the wire. So finely has this been figured out by Uncle Sam that the reel does not revolve until the wire touches bottom, even though that bottom be four or five miles below.

The great deep sea nets are attached to slender wire cables which are wound on drums also provided with ingenious brakes to take up any sudden strain. After the net is down the ship either steams ahead slowly or drifts with wind and current according to circumstances.

When the wire is given to reel in the engines complain and groan at first, for generally the net sinks deep into the ooze and it is hard work to break it from the bottom. But as it ascends the sea washes the mud out of it and finally it begins to come up steadily.

There you may be sure everybody on board climbs up on deck to see what will arrive at the surface. Even in a ship like the Albatross, that makes so many soundings every day, it is a new spot in that unknown world of the ocean. No man can tell what terrible or wonderful thing will appear.

## CROPS FOR OUR ISLANDS.

## Some of the Industries Recommended for Our Tropical Possessions.

It is not intended here to speak at length of the larger crops adapted for tropical possessions, such as sugar, tobacco, coffee and rice, but of some other forms of agriculture which, there is every reason to believe, will develop into important industries. As is well known our Government is now engaged in systematic and extensive investigations in tropical agriculture with a view to the intelligent promotion of the farming interests of our new possessions. A part of the facts given here are taken from the reports thus far printed by our Department of Agriculture.

Many of them are derived from the growing literature appearing in Europe on this most absorbing topic—the development of tropical countries.

Of course every effort will be made to develop and perfect the larger crops above mentioned and there is room for great improvement. The Philippines, with enormous capacity for rice production, do not always grow enough for the home need and large quantities are imported from Cebu. The islands, in fact, are a rice importing instead of an exporting region. This condition will be changed under more intelligent management.

The banana of Porto Rico is highly esteemed for the quality, but much improved by better methods of cultivation and especially by better curing, fermenting and sorting of the leaf. The raw banana sugar of the Philippines is an important article of export but the primitive methods employed result in an inferior product that brings a low price, while the Philippines may be made to compete with Java in the production of cane sugar. Coffee is the largest export of Porto Rico but modern methods of cultivation are not employed and our experts say that the product per acre may be more than doubled.

The gradual improvement of agricultural methods in our new possessions is coming, and it will show marked results in a larger quantity and better quality of the more important crops.

There are many products which may or may not be profitable to raise for export, and their commercial value can be ascertained only by thorough and scientific investigation. The fact that our first experiment station in Porto Rico has begun, first of all, to inquire into the practicability of raising such crops as sugarcane, tobacco, coffee, and rubber, is a very good indication that we are now doing from Porto Rico and from southern Spain and the Canary Islands.

At first view there seem to be some difficulties in the way. A few Americans have been able to raise superior vegetables on the island and sell them in the towns not many miles from their gardens, at much higher prices than vegetables command here. The Northern vegetables now raised there are usually inferior to ours and sell in Porto Rico at a higher price than we are willing to pay, so that there is no possibility of export. The question to be determined is whether Northern vegetables of fine quality can be raised in export quantities so that the abundance at home will reduce prices and make it possible to export, as a rule, we must look to our colonies not for things that we grow in our own gardens and fields, but for commodities that are distinctive of tropical countries.

The great question is how our colonies shall be fitted to provide us with a large number of tropical products which we now buy in enormous quantities from foreign countries. Why should not Porto Rico supply us with the bananas for which we pay \$5,000,000 a year to Jamaica and Central America? The Porto Ricans raise and eat millions of bananas, but do not export them. In time past some of the varieties they have grown have been noted for their excellence, but for many years bananas have grown just as they happened to grow; the quality is inferior and they are worthless for export; and yet the soil and climate are admirably suited for the banana.

This question is to be worked out and the probability is that some day we shall know Porto Rico as a large exporter of bananas. There is no reason why Porto Rico should not send us coconuts by the shipload.

Foreign islands in the Pacific send us millions of coconuts through San Francisco. We like the most of them, but we do not buy them. The coconuts are large quantities of it. Copra, the sun-dried meat, is sent in enormous quantities to Europe where the oil is expressed and used to make soap. Coir, the fibres of the husk, is used to make brushes and coarse fabrics. Porto Rico grows large supplies of coconuts, but exports very few and prepares no copra or coir. Most of the nuts are picked while still green and are sold in the towns merely for the milk they contain, which is the most popular beverage in the island. Here is a source of wealth that will not be neglected when the island enjoys the prosperity to which its resources entitle it.

For three centuries Porto Rico has been noted for the size and quality of its pineapples. Under the new political conditions, however, the island is, for the first time, beginning to give serious attention to the cultivation of this fruit, which thus far has grown wild or nearly so. Under the Spanish rule it was practically impossible to ship the fruit profitably to the United States. Between the island and Florida we should be able to procure all the pineapples we want in our own territory.

There is a growing demand for a tropical fruit, now very little known, the alligator pear. It is a pear only in shape and is served as a salad or relish rather than as a fruit. The pears now bring from 30 to 40 cents apiece in the markets of New York, London and Paris, a ridiculous price due to their scarcity. It is a very small fruit, but it is growing in fact and Porto Rico is able to send them to market in large quantities and of the very best quality.

Our experts say that the south side of Porto Rico is admirably adapted to grow the best qualities of the mango to perfection—not the mango that we buy from Jamaica, which has been described as a mixture of tow and turpentine owing to its fibrous flesh and resinous taste. The best varieties of the mango stand in the highest rank of tropical fruits, and excellent conditions for raising them are said to exist in Porto Rico.

We are now dependent entirely upon foreign countries for the cacao from which we make thousands of tons of chocolate. It is still high in price, and is one of the most promising branches of tropical agriculture. The fact that the large fruit is borne on a slender stem which is easily broken off by a single blow, and that it is able to compete successfully with the product of Latin America. There is a large extent of territory in the archipelago that is said to be well adapted for cacao culture. The tree has not yet been grown there in important quantities.

The camphor forests of Formosa yield 6,000,000 pounds of camphor a year, that island controlling the world's trade in the commodity. As Formosa is the geographical neighbor of northern Luzon, why may not camphor be produced in our own territory? The tree is hardy, easy to cultivate, and grows in China and Japan, and even in our Gulf States and Arizona. It requires tropical conditions to produce gum in commercial quantities. The prospects that Luzon may profitably raise the camphor tree are so encouraging that the experiment will certainly be tried.

None of our colonies raises cassava or manioc, the most important of the tropical root crops, the food of many millions of people in Africa and tropical America. Tapioca is obtained from this root. Few more profitable crops can be raised by any tropical farmer who has laborers to feed.

The crop of coconuts and sugar, with the possible exception of cassava, are only examples of many agricultural industries which, it is believed, may be developed in our island possessions with a view to a large export trade. There are many other industries that promise finely if they can be made to succeed in the colonies. What, for example, are the prospects of tea raising, of vanilla culture, of jenkins, in the drier southern parts of Porto Rico, of oranges, rubber and many other commodities? These are questions that in the course of a few years will be carefully considered.

Enough has been said here to show the great importance of the investigations now in progress to determine the exact nature of the agricultural conditions in our tropical lands and how best to utilize their resources. It is a work of enormous labor, but the results will undoubtedly start the colonies in the right direction and enable them to utilize their great natural wealth to the best advantage for themselves, the mother country and the world.

**PIGEONS AT SEA.**  
Carried in Deep-Water Ships, Sometimes for Fun, but Mostly as Pets.

Stepping about on the deck of a German ship lying at a South Sea wharf in the midday glare, gentle manner of their kind, were three pigeons. There were two parent birds, and one of their young, all clearly cut at home amid their strange surroundings.

These birds were taken aboard the ship at a port on the west coast of South America. Here the vessel is loading for Sydney, Australia, and thither the pigeons will go in a few days. They are, however, not so far from home as they seem. They are sometimes made to serve purposes of utility, such as carrying messages; but commonly pigeons found on board vessels are simply pets. They have a house on deck and they come out in fair weather and walk about on deck, everybody's friend, for all hands like them. They become very tame and they may walk into the cabin and hop up onto the table and take their meals with the captain or the first officer.

Pigeons carried at sea often fly about around the ship, or make long flights from it, but, barring mishap, they always return to it. They may keep on the wing near or far for half a day at a time and yet come back.

Pigeons do sometimes fly away and do not come back, having doubtless become lost. And then sometimes pigeons that seemed to have been carried on board, and were on the decks of a ship at sea; they have come lost from some other ship and had fortunately discerned this one and so saved themselves.

If ships were in company or anywhere near on the sea pigeons, that might be aboard either would be likely to visit the other. They would go back to where they belonged.

They stick to the ship when in port with curious closeness, not going ashore at all. They are carried on board a wharf for days or weeks at a time in unloading and loading, but the pigeons stay right aboard.

Not so, for instance, the dog often to be found carried on a ship. The dog is a rover and a prowler, and he likes to go ashore and look around and see the place and the people and what is doing, and he goes ashore whenever the ship is in port.

The day the three pigeons here referred to were aboard the ship, the ship was in the South Sea, and the ship was going to the same place, the ship's dog, the dog had been ashore, looking the town over, and was now going back to the ship.

The vessel was nearly loaded, and as it happened, the tide was low, so that the ship, at the moment, was low in the water, and the people were on a level with the edge of the steps. This he did without difficulty, as doubtless he had often done before.

The pigeons carried thus at sea on deep-water ships are likely to stay by the vessel until they lose their lives by accident. They are coming back from a flight, a pigeon will be caught in the downdraft of wind in a sail and dashed into the sea. But they may survive for a long time. They are coming back from a flight, a pigeon will be caught in the downdraft of wind in a sail and dashed into the sea. But they may survive for a long time.

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## VANDALS IN THE SOUTHWEST.

## AMERICAN ANTIQUITIES IN JERED BY CURIO DEALERS.

Hasages in the Homes of the Cliff Dwellers. But in Montezuma, Castle, the structure in the Petrified Forest. Relics Carried Off by the Carload.

POMONA, Cal., Sept. 26. Serious damage has been done in the past year to the prehistoric remains of the Southwest by the voracious for relics carried on by dealers in curios. Several large collections of these relics have sold for fancy sums and with the discovery of the commercial value of such things reckless depredations have been committed in the homes of the ancient cliff dwellers and in the great and mysterious buildings of the plains. Every year vandalism makes more difficult the scientific investigation of the prehistoric civilization represented by these remains.

It was perhaps the finest and oldest of relic hunters, the Colonel, that in all the world, has been shamefully mistreated during the past year. This is Montezuma, the majestic communal habitation that stands upon the precipitous cliff on Beaver Creek, a branch of the Verde River in Yavapai county, northern Arizona. Prof. Samuel Wren of Cambridge University, England, pronounced it twenty years ago the most marvelous prehistoric dwelling in the civilized world.

Montezuma's Castle, it never had anything to do with the Aztec Montezuma, has, it is believed, been occupied by the ancient cliff dwellers, three or four thousand years ago. Its construction shows remarkable engineering and architectural skill considering the limited resources of its builders.

It is built of heavy stone cemented together in walls four feet thick. In height the castle is fifty-two feet. It is of crescent shape and is seventy-five feet long. It contains thirty-one rooms. Such a ruin would be guarded with jealous care were it in a European country, but it has received no protection.

Every year the overthrow of some of its walls in the efforts of relic-dealing explorers to exhume mummies and to get articles of dress, jewelry and buried vessels of prehistoric days. One of the principal rooms in the great pile was completely ruined last year by blasting open the supposed vaults there in the hope of getting relics for exhibition at the Pan-American Exposition, and in the past four months a great wall, which undisturbed might have endured a thousand years longer, fell with a crash in the canon below because of undermining by reckless curiosity.

The work of destroying the cliff dwellings in southern Utah is now well nigh complete. Dr. James B. Weller of Chicago University was shocked upon recently visiting the Utah cliff dwellings to observe the wholesale havoc that has been wrought there since he explored that region eleven years ago.

What used to be superb remains for scientific study are now irreparably destroyed for satisfactory investigation. From the Utah cliff dwellings seven tons of relics were taken for exhibition at the Chicago Exposition, and were afterwards auctioned off as curios in a Chicago shop.

Temples of ancient Kings and Queens were blown open, and dynastic ruin ascended corner chambers and tribal castles that had been built with infinite patience and remarkable skill on the ledges of towering cliffs.

Another manifestation of the same spirit concerns the petrified forest, the largest and most marvellous relic in the Southwest, in northern Arizona. It has been hacked to pieces and carried away wholesale by vandals.

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## SWITZERLAND IN WAR TIME.

## Fortresses by Which She Will Defend Her Neutrality.

We are in the habit of looking upon Switzerland as a peaceful country, living in the midst of the four great European Powers with her armed hosts, its own army but a handful of hardy mountaineers, with little interest in military matters. But this is far from being the case, for Switzerland is perfectly aware of the strategic importance of her situation, and knows that if she cannot defend her neutrality by force of arms her territory may soon become the theatre of operations of the great armies about her. Consequently, she is improving her army as much as possible, and is fortifying all important points as effectively as her finances warrant.

In all times the inviolability of neutral territory has been merely a question of the strength of the forces available to defend its inviolability. Switzerland cannot hope to preserve her neutrality by the means employed in 1870; she must be ready to defend herself against invasion.

After the war of 1870 it was believed that the Swiss army would alone suffice to protect the country, but in 1878 the idea took root that this military power, perhaps more than any other national army, required that its theatre of operations be strengthened by fortifications and in 1879 the Federal Council took up the question and attempted to obtain an annual credit for the defence of the land. There was too much opposition, however, at that time, and even as late as 1886 only 500,000 francs were voted for this purpose, and these were to be devoted to the improvement of works at St. Maurice, Bellinzona, Aarau and Lunenburg.

Some of the works at St. Maurice, Lunenburg and Bellinzona, however, in this way it was found that these points, even if furnished with modern fortifications, would constitute but an imperfect system; consequently, other points were selected and the new system has since been gradually developed and perfected.

This system comprises a series of fortified points on the ridge of the St. Gothard, with auxiliary works near St. Maurice. The works on the St. Gothard comprise four principal positions, at the Furka, Pass, and Andermatt. The works at the Furka, Pass, at an altitude of 8,000 feet were begun in 1880, and include the battery Galignani, the battery of the Pass, an armored and casemated work, and the battery of the Rhone Glacier, on a plateau northeast of the pass, with a 4.7-inch piece in an armored turret, designed to close the pass and prevent the invasion of the country.

Behind the fort are buildings for the men and arms destined to carry on the mobile defence of this sector, as well as stores for ammunition, supplies and construction material.

These works are primarily designed to command the pass, through which passes the railway from Zurich to the south, and to the valley of the Rhone, and the road for pedestrians leading from Oberwald to the Valley of the Aar. Incidentally, they also command the Furka Pass, over which the works of the St. Gothard railway are turned. The better to effect this, the field of fire of the Galignani battery was enlarged, carriage roads were constructed, and various buildings and other works were put up to the front of the Furka Pass position.

The fortifications at Oberalp Pass, which began in the same year, and comprise the redoubt of Calmet, to the east of Oberalp Pass, and the battery of the Rhone Glacier, to the west of the redoubt. North of the redoubt is an infantry position strengthened with a 4.7-inch rapid-fire howitzer. From this point a line of fortifications runs to the east of the Grossboden Pass, the camp of Loch, where the mobile defence is concentrated. These works are designed to guard the pass and the road from Andermatt to Disentis, and to the south, where the works of the St. Gothard railway are turned. The better to effect this, the field of fire of the Galignani battery was enlarged, carriage roads were constructed, and various buildings and other works were put up to the front of the Furka Pass position.

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